

CLAIMS

1. An ice making apparatus comprising:
 - a. A mold for holding water and shaping the water as it turns to ice;
 - b. A heat transfer device in thermal contact with the mold for cooling the mold at a selective rate;
 - c. A processor for controlling the heat transfer device, the processor causing the heat transfer device to perform the steps of:
 - i. Cooling the mold at a high rate, until the water substantially reaches its freezing temperature;
 - ii. As the water freezes, cooling the mold at a lower rate; and
 - iii. After the water freezes to ice, cooling the mold at a high rate, until a predefined temperature of the ice is reached.
2. The ice making apparatus of claim 1, further comprising a device for ejecting the ice from the mold.
3. The ice making apparatus of claim 1, further comprising a heat sink coupled to the heat transfer device opposite the mold.
4. The ice making apparatus of claim 3, wherein the heat sink includes fins for dissipating heat.
5. The ice making apparatus of claim 1, wherein the heat transfer device comprises a thermoelectric cooler.
6. The ice making apparatus of claim 1, wherein the heat transfer device is thermally coupled to the mold through a metal heat conducting block.

7. The ice making apparatus of claim 1, wherein the processor comprises a microcontroller.
8. The ice making apparatus of claim 1, further comprising a temperature sensor coupled to the mold, wherein the processor senses the temperature of the mold using the temperature sensor.
9. The ice making apparatus of claim 1 wherein the predefined temperature is less than 32°F.
10. The ice making apparatus of claim 1 wherein the predefined temperature is 0°F.
11. An ice making apparatus comprising:
 - a. A mold for holding water and shaping the water as it turns to ice;
 - b. A heat transfer device in thermal contact with the mold for selectively heating or cooling the mold;
 - c. A cooling source for cooling the water in the mold; and
 - d. A processor for controlling the heat transfer device as the cooling source cools the water in the mold, the processor causing the heat transfer device to perform the steps of:
 - i. Cooling the mold in combination with the cooling source, until the water substantially reaches its freezing temperature;
 - ii. As the water freezes, heating the mold to slow down the cooling of the water by the cooling source; and
 - iii. After the water freezes to ice, cooling the mold in combination with the cooling source, until a predefined temperature of the ice is reached.

12. The ice making apparatus of claim 11, further comprising a device for ejecting the ice from the mold.
13. The ice making apparatus of claim 11, further comprising a heat sink coupled to the heat transfer device opposite the mold.
14. The ice making apparatus of claim 13, wherein the heat sink includes fins for dissipating heat.
15. The ice making apparatus of claim 11, wherein the heat transfer device comprises a thermoelectric cooler.
16. The ice making apparatus of claim 11, wherein the heat transfer device is thermally coupled to the mold through a metal heat conducting block.
17. The ice making apparatus of claim 11, wherein the cooling source uses convection to cool the water.
18. The ice making apparatus of claim 11, wherein the cooling source comprises a freezer section of a refrigeration device.
19. The ice making apparatus of claim 11, wherein the cooling source comprises a refrigeration section of a refrigeration device.
20. The ice making apparatus of claim 11, wherein the processor comprises a microcontroller.

21. The ice making apparatus of claim 11, further comprising a temperature sensor coupled to the mold, wherein the processor senses the temperature of the mold using the temperature sensor.
22. The ice making apparatus of claim 11, wherein the predefined temperature is less than 32°F.
23. The ice making apparatus of claim 11, wherein the predefined temperature is 0°F.
24. An ice making apparatus comprising:
 - a. A mold for holding water and shaping the water as it turns to ice;
 - b. A heat transfer device in thermal contact with the mold for heating the mold at a selectable rate;
 - c. A cooling source for cooling the water in the mold; and
 - d. A processor for controlling the heat transfer device as the cooling source cools the water in the mold, the processor performing the steps of:
 - i. Once the cooling source causes the water to substantially reach its freezing temperature, activating the heat transfer device to slow down the cooling of the water by the cooling source; and
 - ii. After the water freezes to ice, deactivating the heat transfer device.
25. The ice making apparatus of claim 24, further comprising a device for ejecting the ice from the mold.
26. The ice making apparatus of claim 24, further comprising a heat sink coupled to the heat transfer device opposite the mold.

27. The ice making apparatus of claim 26, wherein the heat sink includes fins for dissipating heat.
28. The ice making apparatus of claim 24, wherein the heat transfer device is thermally coupled to the mold through a metal heat conducting block.
29. The ice making apparatus of claim 24, wherein the cooling source uses convection to cool the water.
30. The ice making apparatus of claim 24, wherein the cooling source comprises a freezer section of a refrigeration device.
31. The ice making apparatus of claim 24, wherein the processor comprises a microcontroller.
32. The ice making apparatus of claim 24, further comprising a temperature sensor coupled to the mold, wherein the processor senses the temperature of the mold using the temperature sensor.
33. The ice making apparatus of claim 24, wherein the predefined temperature is less than 32°F.
34. The ice making apparatus of claim 24, wherein the predefined temperature is 0°F.
35. A process for making ice within a mold coupled to a heat transfer device, the process comprising the steps of:
 - a. Filling the mold with water;

- b. Cooling the mold with the heat transfer device at a high rate, until the water substantially reaches its freezing temperature;
 - c. As the water freezes, cooling the mold with the heat transfer device at a lower rate;
 - d. After the water freezes to ice, cooling the mold with the heat transfer device at a high rate, until a predefined temperature of the ice is reached.
- 36. The process of claim 35, wherein the predefined temperature is less than 32°F.
- 37. The process of claim 35, wherein the predefined temperature is 0°F.
- 38. A process for making ice within a mold coupled to a heat transfer device, wherein water within the mold is cooled by a cooling source, the process comprising the steps of:
 - a. Filling the mold with water;
 - b. Cooling the mold with the heat transfer device in combination with the cooling source, until the water substantially reaches its freezing temperature;
 - c. As the water freezes, heating the mold with the heat transfer device, to slow down the cooling of the water by the cooling source;
 - d. After the water freezes to ice, cooling the mold in combination with the cooling source, until a predefined temperature of the ice is reached.
- 39. The process of claim 38, wherein the predefined temperature is less than 32°F.
- 40. The process of claim 38, wherein the predefined temperature is 0°F.

41. A process for making ice within a mold coupled to a heat transfer device, wherein water within the mold is cooled by a cooling source, the process comprising the steps of:
 - a. Filling the mold with water;
 - b. Once the cooling source causes the water to substantially reach its freezing temperature, activating the heat transfer device to slow down the cooling of the water by the cooling source;
 - c. After the water freezes to ice, deactivating the heat transfer device.
42. The process of claim 41, wherein the predefined temperature is less than 32°F.
43. The process of claim 41, wherein the predefined temperature is 0°F.